

# Pulsation Dampeners



# Pulsation Dampeners

Positive Displacement (PD) pumps create pulsation and hydraulic shock due to the reciprocating nature of their stroking action, potentially damaging the entire pumping system. Pulsation Dampeners remove virtually all hydraulic shock, and thus enhancing the all-around performance and reliability of fluid handling equipment in industrial, chemical transfer, and precision metering applications.

## Benefits

- Produces a near steady fluid flow up to 99% pulsation and vibration free
- Protects pipes, valves, fittings, meters and in-line instrumentation from destructive pulsations, vibrations, cavitation, and water hammer
- Creates steady and continuous flow when dosing, blending or proportioning additives
- Insures accuracy, longevity, and repeatability of in-line meters
- Enables uniform application of material in spraying and coating systems
- Reduces product agitation, foaming, splashing and degradation of product

## Features

- Sizes available for all P-Series pumps
- Simple, reliable design and quick installation
- Easy in-line maintenance
- Pressure ranges up to 4000 PSI (276 bar) available from stock
- Temperature ranges from -60°F to 350°F (-51°C to 176°C) available from stock
- Custom models available
- Bodies available in a full range of chemical resistant materials
- Bladders available to match all P-Series pump diaphragm materials

## Markets Served

- Chemical Process
- Pulp, Paper & Textile
- Gas, Oil, & Petrochemical
- Biotech/Pharmaceutical
- Paint & Coating
- Food & Beverage
- Consumer Products
- Water Treatment

## Applications

- Transferring
- Filtering
- Printing
- Dosing
- Filling
- Metering
- Spraying
- Coating
- Injecting
- Mixing



## Bladder Options

### Bladder

Material	Application Recommendations
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Neoprene	Good abrasion resistance and flex; use with moderate chemicals
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Buna-N	Good flex life; use with petroleum, solvents and oil-based fluids
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EPDM	Good for extreme cold; good chemical resistance with ketones, caustics
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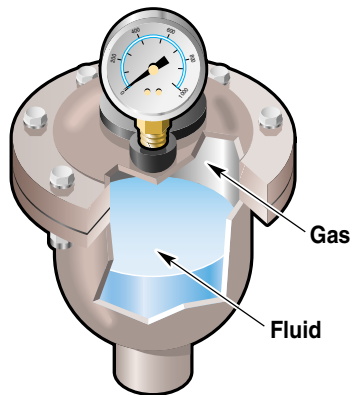
Viton	Good for hot & aggressive fluids; use with aromatics, solvents, acids & oils
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PTFE	Bellows design; excellent flex life; use with highly aggressive fluids
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## Chargeable Air Control

The chargeable model has a Schrader-type charging valve that allows for a predetermined pressure charge to be applied and held in the dampener. No permanent source of compressed gas is required to be attached to the unit. The chargeable models are used primarily with metering pumps for pulsation dampening.

## Principle of Operation



### Discharge Pulsation

Compressed air or gas is introduced into the air chamber of the pulsation dampener to a specified pressure. The gas is entrapped by the elastomeric bladder, which prevents contact between the process fluid and compressed gas. (Without the bladder, the gas would dissolve into the fluid, dampening would become ineffective, and product contamination would occur due to absorbed gas.) During the pump discharge stroke, fluid enters the wetted chamber of the pulsation dampener displacing the bladder, compressing the gas and absorbing the shock. During pump inlet stroke, liquid pressure decreases, the dampener gas expands, pushing fluid back into the process line. System shock and pulsation is significantly reduced.

For pumps with multiple pumping chambers and overlapping discharge strokes, maximum pulsation occurs during the overlap portion between adjacent pumping chambers. Peak pressures produced at the pump discharge are absorbed by the pulsation dampener (compressing gas on the air side of the bladder). Pressure dips are filled in by the pulsation dampener as the compressed gas expands, providing fluid back into the system. Very smooth discharge pressure and flow are the result.

## Dampener Selection Process

### Determine application

- Discharge pulsation
  - < 1000 psig
  - > 1000 psig

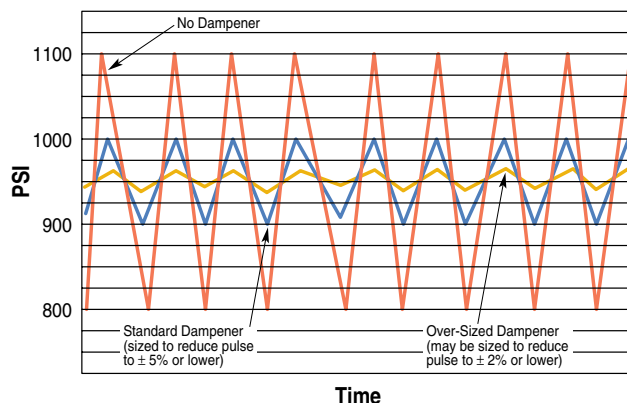
### Select dampener size

- Based on P-Series pump model and application, select the appropriate cubic inch size from chart below:

### Select Dampener model

- Use the appropriate dampener size charts on the following pages to select the specific model with the desired housing materials, bladder material, pressure and temperature performance
- Contact Wanner Engineering for special order units with other construction materials and temperature limits.

Pump Model	Discharge Pulsation	
	<1000 psig	>1000 psig
<b>P100</b>	4 C.I.	12 C.I.
<b>P200</b>	4 C.I.	12 C.I.
<b>P300</b>	4 C.I.	12 C.I.
<b>P400</b>	4 C.I.	N/A
<b>P500</b>	4 C.I.	12 C.I.
<b>P600</b>	10 C.I.	N/A
<b>P700</b>	36 C.I.	12 C.I.



# Pulsation Dampeners

## 4 Cubic Inch Dampeners

- 1/2" FNPT inlet
- Bolted fasteners
- Choice of housing construction and bladder materials
- Chargeable air control standard



## CS Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	1000	10 (-12)	190 (88)	110-040
Neoprene	1000	0 (-18)	200 (93)	110-042
EPDM	1000	-4 (-40)	280 (140)	110-043
Viton	1000	-10 (-23)	350 (177)	110-045
PTFE	600	40 (5)	250 (121)	110-048

## Polypropylene Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	150	32 (0)	175 (79)	110-000
Neoprene	150	32 (0)	175 (79)	110-002
EPDM	150	32 (0)	175 (79)	110-003
Viton	150	32 (0)	175 (79)	110-005
PTFE	150	40 (5)	175 (79)	110-008

## SST Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	1000	10 (-12)	190 (88)	110-060
Neoprene	1000	0 (-18)	200 (93)	110-062
EPDM	1000	-40 (-40)	280 (140)	110-063
Viton	1000	-10 (-23)	350 (177)	110-065
PTFE	600	40 (5)	250 (121)	110-068

## PVDF Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	150	10 (-12)	190 (88)	110-020
Neoprene	150	10 (-12)	200 (93)	110-022
EPDM	150	10 (-12)	250 (121)	110-023
Viton	150	10 (-12)	250 (121)	110-025
PTFE	150	40 (5)	250 (121)	110-028

## Hastelloy C Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	1000	10 (-12)	190 (88)	110-090
Neoprene	1000	0 (-18)	200 (93)	110-092
EPDM	1000	-40 (-40)	280 (140)	110-093
Viton	1000	-10 (-23)	350 (177)	110-095
PTFE	600	40 (5)	250 (121)	110-098

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## 10 Cubic Inch Dampeners

- 1/2" FNPT inlet
- Bolted fasteners
- Choice of housing construction and bladder materials
- Chargeable air control standard



### CS Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	1000	10 (-12)	190 (88)	110-240
Neoprene	1000	0 (-18)	200 (93)	110-242
EPDM	1000	-40 (-40)	280 (140)	110-243
Viton	1000	-10 (-23)	350 (177)	110-245
PTFE	150	40 (5)	250 (121)	110-248

### Polypropylene Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	150	32 (0)	175 (79)	110-200
Neoprene	150	32 (0)	175 (79)	110-202
EPDM	150	32 (0)	175 (79)	110-203
Viton	150	32 (0)	175 (79)	110-205
PTFE	150	40 (5)	175 (79)	110-208

### SST Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	1000	10 (-12)	190 (88)	110-260
Neoprene	1000	0 (-18)	200 (93)	110-262
EPDM	1000	-40 (-40)	280 (140)	110-263
Viton	1000	-10 (-23)	350 (177)	110-265
PTFE	150	40 (5)	250 (121)	110-268

### PVDF Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	150	10 (-12)	190 (88)	110-220
Neoprene	150	10 (-12)	200 (93)	110-222
EPDM	150	10 (-12)	250 (121)	110-223
Viton	150	10 (-12)	250 (121)	110-225
PTFE	150	40 (5)	250 (121)	110-228

### Hastelloy C Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	1000	10 (-12)	190 (88)	110-290
Neoprene	1000	0 (-18)	200 (93)	110-292
EPDM	1000	-40 (-40)	280 (140)	110-293
Viton	1000	-10 (-23)	350 (177)	110-295
PTFE	150	40 (5)	250 (121)	110-298

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# Pulsation Dampeners

## 12 Cubic Inch Dampeners

- 1/2" FNPT inlet
- PTFE: Bolted fasteners  
Buna-N, EPDM, and Viton: Ring fasteners
- Choice of bladder materials
- Chargeable air control



## SST Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	4000	10 (-12)	190 (88)	110-360
EPDM	4000	-40 (-40)	280 (140)	110-363
Viton	4000	-10 (-23)	350 (177)	110-365
PTFE	2000	40 (5)	250 (121)	110-368

*12ci dampener with PTFE bladder (left); all other bladder materials (right).*

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### 36 Cubic Inch Dampeners

- 1" FNPT inlet
- CS, SST, and Hastelloy C : Bolted fasteners  
Polypropylene and PVDF: Metal ring flange fasteners
- Choice of housing construction and bladder materials
- Chargeable air control standard



#### CS Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	1000	10 (-12)	190 (88)	110-640
Neoprene	1000	0 (-18)	200 (93)	110-642
EPDM	1000	-40 (-40)	280 (140)	110-643
Viton	1000	-10 (-23)	350 (177)	110-645
PTFE	600	40 (5)	250 (121)	110-648

#### SST Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	1000	10 (-12)	190 (88)	110-660
Neoprene	1000	0 (-18)	200 (93)	110-662
EPDM	1000	-40 (-40)	280 (140)	110-663
Viton	1000	-10 (-23)	350 (177)	110-665
PTFE	600	40 (5)	250 (121)	110-668

#### Hastelloy C Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	1000	10 (-12)	190 (88)	110-690
Neoprene	1000	0 (-18)	200 (93)	110-692
EPDM	1000	-40 (-40)	280 (140)	110-693
Viton	1000	-10 (-23)	350 (177)	110-695
PTFE	600	40 (5)	250 (121)	110-698

#### Polypropylene Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	150	32 (0)	175 (79)	110-600
Neoprene	150	32 (0)	175 (79)	110-602
EPDM	150	32 (0)	175 (79)	110-603
Viton	150	32 (0)	175 (79)	110-605
PTFE	150	40 (5)	175 (79)	110-608

#### PVDF Construction

Bladder	Max PSI	Temperature °F (°C)		Part #
		Min	Max	
Buna-N	150	32 (0)	175 (79)	110-620
Neoprene	150	32 (0)	175 (79)	110-622
EPDM	150	32 (0)	175 (79)	110-623
Viton	150	32 (0)	175 (79)	110-625
PTFE	150	40 (5)	175 (79)	110-628